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The paradigm of sustainability in the Brazilian energy sector

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Abstract

The concept of sustainability can be a way to understand the dynamics of reality and to consider not only the economic growth but also the social, environmental and cultural aspects of development. This new paradigm questions the role of nature as an instrument only to satisfy the human needs and brings into consideration the rational use of natural resources through responsible environmental policies keeping in mind the needs of the future generations. The economic growth, considered as the notion of progress, brings intrinsically not only the extensive nature exploitation but also the intensification of the energy use. Energy sources become, then, a strategic variable for the economic development. The Brazilian energy policy is an appropriate case study for the paradigm of sustainability overview as it is characterized by isolated initiatives and programs, which culminated into a huge crisis. So, this paper aims to discuss the concepts of sustainability and ethics through the analysis of the Brazilian energy policy and its social and environmental implications.

Keywords: Energy; Sustainability; Brazilian energy sector

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1. Introduction

The process of human development is strictly related to the evolution of the dominion over the exploration and use of the energy sources present in nature and to the structuring of complex energy systems. Such fact allows establishing the appropriation of a knowledge that defines differentiating points of quality and technological superiority between coexistent cultures and societies settled in different historical moments [1]. Consequently, if on one hand the human needs are limitless, on the other hand the sources of supplying those needs are limited. The dynamics of the economical activities searches to supply the satisfaction of the human needs in a rational way considering the natural limiting factors, which conditions the production, transformation, distribution and consumption of energy.

With the industrialization process, the appropriation of the nature was no longer a result of the human or animal work, but it started to include the science and technology to magnify the production, breaking important paradigms. The economical growth was due not only to the extensive exploration of the nature, but also to the energy intensive processes, which obtained such importance that became the basis of the development and its availability the center of this rupture. The progress was perceived by the search of energy sources and its control is nothing else than a political action over the territory [2]. Hémery [1, p. 140] corroborates such statement saying "*The capitalism represents a rupture with all the energy systems that the humanity had acquaintance until then. With it, it is interrupted all the primacy of the biological energies and it is established the fossil energies one*".

This rupture represented an alternative to the challenges put by the cyclical shortage of energy, lands and resources. The solution came based on three paths: the intensification of the existent energy chains, the creation of new technologies, and the exploration of the available resources. The rupture of this paradigm determines, therefore, the continuous development of the technological innovations, and the adaptation of the energy system according to the international economic system in a remarkably unequal structure. It is a priority, then, to have the control over the dynamics of the technological innovation processes for the maintenance of a prominence position in the world scenario, remaining the dependence for the excluders. The perpetuation of the dependence process is made through the control that the developed countries have over the services of infrastructure of the developing countries, using for that pressures over the products and services linked to the energy chain, because they are natural monopolies that have captive and growing

markets [3, p. 115], requesting a great volume of investments and generating a high level of appropriation of income.

The Brazilian energy sector followed the same logic of dependence and unequal structuring of the energy benefits. Considering the concept of sustainable development as established by the Brundtland Commission, the energy consumption must be defined based on the foreseeable needs and expectations of the future generations. However, the notable social-economic differences perceived in the Brazilian geographical regions are reflected in the structure of energy sources' use. The Brazilian National Energy Balance, for example, shows that a northeastern citizen has a much less per capita consumption than an inhabitant of the southeast of the country. This relation is similar to the comparison of the Brazilian per capita consumption with the energy consumption of developed countries. In fact, the Brazilian consumption is almost eight times less than the North American one.

So, the unequal distribution and access of energy in Brazil is structural and leads to a differentiated way of treating the environment and meeting social and economical energy demands. This discussion raises many ethical issues including [4]:

1. the rights of access to electricity;
2. the balance between renewable and non-renewable sources;
3. the consideration of subsidies, and external, environmental and social costs;
4. the assessment of the impact of energy policies on the environment;
5. the implications of the energy choices for the future generations.

Considering these approaches, this paper has the objective of analyzing the Brazilian electric sector though the discussion of the concepts of sustainability and ethics.

2. Energy and development

The man's differentiation with the other elements of the nature, lively or inanimate, results in an endless classification. From everything that can be identified as element to distinguish men from the animals, Marx and Engels [5] point the capacity to produce their means of subsistence, which is the mark of this distinction. However, the way men produce their material life depends on the nature of the means of subsistence that they need to reproduce [5].

The process of human development is narrowly related with the evolution of the exploration and use domain of the energy sources present in nature and the structuring of complex energy systems. While the human needs are limitless, the natural resources, primary source of supply of those needs, are limited. The dynamics of the economical activities includes the satisfaction of the human needs in a rational way when facing the natural obstacles. Consequently, the production, transformation, distribution, and consumption of energy should be guided for the satisfaction of those needs.

This fact allows establishing the appropriation of a knowledge that defines differentiating points of quality and technological superiority between coexistent cultures and societies in other historical moments [1, p. 35]. Marx and Engels consider that the fundamental distinction between men and animals is only possible of being verified when the man starts to produce their means of subsistence, "*a step which is conditioned by their physical organization. By producing their means of subsistence men are indirectly producing their actual material life.*" [5, p. 11].

Thus, the materialization of human needs and desires are made, in great measure, through energy. Being one of the factors that foster development and human survival, the energy assumes a strategic trait for the economy of the country. The electricity does not represent an energy source, but a convenient use form of energy, and its comfort lies in the fact that can be used in variable amounts and in agreement with the presented need [6]. Besides that, its regular flow leads to a great efficiency and versatility, allowing several uses and opening new fronts for economical insertion. Thus, technological progresses are making possible the amplification of the use of electric power either by new technical discoveries in terms of generation, transmission and distribution, or by its wide geographical reach. If on one side, energy allows the development and satisfaction of the more and more demanding needs of part of the population, on another side, it maintains an even bigger part away from its benefits, besides generating a series of impacts on the natural resources and on the social–cultural environment.

The notion of progress implicit in the continuous earnings allowed by the amplification of energy availability and use possesses as central idea the debate between growth and development. The technical and scientific development allowed the substitution of energy, the fast penetration of electricity and, as a consequence, the creation of a market of new equipments, that incorporated new consumption habits in society. Such facts corroborated the idea that the energy consumption growth corresponded to an increase in the level of the society development [7]. Nowadays, the evaluation of the increase of the electric power consumption as an improvement of the development is quite questionable, where it is argued that:

- the improvement in the social distribution of the acquired benefits for the development of the electric sector does not happen in a fair way;
- the technological progresses allow a larger efficiency in the operation of the systems, especially of the final consumption, privileging once again the developed countries and social groups of a larger purchasing power;
- an effective politics of energy economy and conservation allows great reductions in the consumption and in the needs of amplification of the generating park.

The development should include the perspective of the energy as an environmental patrimony that belongs to the collectivity. The developmental patterns of the electric sector should, therefore, be conditioned to the right of accessing the energy once its use represents the use of this common patrimony. However, this statement can incite actions to increase the supply as well as to conserve the energy, and determine a pattern of privatizing the profits and dividing the costs with the society, favoring the emergence of social inequalities [6].

In this sense, the State represents the entity that manages this common patrimony. The choice process of the actions and goals of the State seems to be a reference that privileges the development ruled by an economical model that generates concentration of income and poverty. For Touraine [8], the State and its power should not be classified or identified with certain groups.

Nowadays, a great part of the world population could not have financial resources to guarantee the purchase of the energy, remaining the use of non-conventional ways of energy, in other words, firewood, agricultural residues, animal and human traction [9]. In Brazil, about 12% of the population does not have access to the electricity, and the majority of this total is strongly concentrated in the rural areas. In order to promote the

Brazilian development it is necessary that the State's actions focus the guarantee of equity in the access, quality of the use and sustainability of the energy system. All of this goes through the overcome of the developmental paradigm as the only way of promoting the strictly economical growth, starting to consider the environmental and social variables.

3. Sustainability

Sustainability is defined as "*a characteristic of a process or a state that can be maintained indefinitely*" [10, p. 10], and its key is the balance between the human population and the limited capacity of the Earth resources. Sachs [11] established the dimensions of the sustainability concept: the social, economical, ecological, space and cultural sustainability. These are general aspects that can be applied to any sector. The social sustainability pleat a larger justness in the distribution of the income among the groups; the economical is represented as the regularization of the external and internal investments; the ecological includes the development of the natural resources with minimum damages to the atmosphere; the space emphasizes the best distribution of the establishments; and the cultural seeks to adopt changes that respect its continuity and a larger participation in the technological changes.

Pires [12, p. 22], states that those five dimensions can be unite in only 3: "*economical, social-political and biophysical*." The interaction of these dimensions with the development process is a necessity that highlights the importance of the planning for the subject. The 'optimism' of the Brundtland Report, as referred Pires, presupposes the conciliation of interests at first incompatible, like economical growth and ecological preservation, contributing to give a new perspective for the planning.

Pires also detaches two senses for the concept of sustainable development. The conservative has for basis the economical theory, and is synonymous of sustainable growth, joining "*notions of stability*, *complementarily*, *energy recycling*, *and of dynamic balance*" intrinsic to the sustainability concept, with the "*expansion, uniformity*, *homogeneity*, *inequality*" to the growth in the capitalist historical sense [12, p. 24]. In this sense, this would not be a new perspective, just an adaptation of concepts. In a more radical conception, sustainable development would be the validation of the limits category for the planning, through the equality, social justness, and cultural and ecological preservation, all of these concepts linked to this radical meaning [12].

Farshad and Zinck [13] mentioned other aspects in relation to the sustainability. First, it is necessary to assist the social economical. The adoption of preventive practices is also a factor that should be considered, once what is frequently verified is the minimization of the impacts that are extremely onerous. The prevention is a more sustainable and much cheaper practice, besides the fact that in many cases the repair is impossible. Moreover, the stability of the economy and the improvement of the infrastructure are necessary for the development of any sustainable practice.

The sustainable dimensions considered in the Agenda 21 includes: *the ethical dimension*, where the ecological balance translates not only a durable pattern of the society organization but also involves the life of the future generations; *the temporal dimension*, that breaks up with the short term logic and establishes the precautionary principle, as well as the need of a long term planning; *the social dimension*, that expresses the consensus that only a sustainable society can produce a sustainable development; *the practical dimension*,

that determines the need of a change in the consumption habits and behaviors. The economical aspect is complemented by those four dimensions.

To change this scenario of privilege of the economical discourse with the incorporation of some pseudo-environmental aspects, the concept of enlarged sustainability has been debated, aiming at the political encounter between the strictly environmental Agenda with the social one, and enunciating the need of facing the environmental degradation along with the world problem of poverty. In this context, the change in the social and environmental relationships characterizes the paradigmatic transformation of the sustainability, giving support to the formulation of the social sustainability and of the human development in sustainable basis.

While it increases the legitimacy of the paradigm of the sustainability and its pertinence to work with each society, it increases the need to select criteria, strategies and indicators to anchor the formulation, to monitor the implementation and to evaluate the results of the social–environmental policies in sustainable basis. In this sense, the social and the environmental problems are connected. That postulate, basis of the Agenda 21 document, is fundamental for the understanding of the strategies that seek to combine dynamics of social promotion with the dynamics of reduction of the environmental impacts generated by the economical development.

4. The Brazilian energy sector

The policy in the energy area in Brazil historically privileged the attendance of the great industrial consumers' needs and the great cities of the Southeast Area [14], being the expression of a development style that seeks a fast growth through a big concentration of financial resources [15]. In spite of the unquestionable success obtained by this policy in fomenting the industrialization and expanding Brazilian GDP, it also brought serious economical, social, environmental, political, and even cultural consequences.

The adoption of the market policy introduced in the Brazilian Electric Sector in the middle 1980s was an adjustment to the international 'neoliberal' approach. As a consequence, it was adopted in the country a privatization program originated by the implementation of the 'neoliberal' policies as an attempt of better managing the State. The deterioration of the public services, the dismantle of the administration, the unbalance of the federal and state budgets generated reductions in the infrastructure investments in the transportation and energy sector, bankruptcy of a lot of companies due to the increase of the interest rates, decrease in the employment offerings, growth of the informal economy and impossibility of the 'rescuing of the social debt' [16]. About the energy crisis, Pinguelli Rosa [17, p. 138] argue that this "*is not just, as it was seen, an energy crisis. It is a crisis of the economical model, that concerns to the restrictions of public investments and a privatization restricted to the assets of the state companies to attract dollars, without attention to the expansion of the energy supply*".

The market became one of the fundamental points of the model implemented in the electric sector. The difficulties for its consolidation come due to not only the fact of having a hydric basis, but also the impossible presuppositions of economical efficiency for the competition and expansion by the intervention of the private sector. The new stakeholders did not expand the supply system according to the rhythm of the demand growth due to the uncertainties in relation to the return of the investments and the market operation.

4.1. The structure of the electric power sector

The Brazilian electric system attends 47.2 millions consumer units considering a resident population of 169,799,170 people [18]. From the total of the Brazilian population, 64.29% refers to the Center-West, South and Southeast regions. The Northeast has 28.12% of the total Brazilian inhabitants and the North has 7.60%. These two regions have the major index of rural population, with 30.93% and 30.13%, respectively. Besides being the most concentrated in terms of population, 42.65% of the total, the Southeast region has the great majority of the population, 90.52%, living in urban areas. This pattern is followed by the Center-West, South and Southeast regions. Brazil has a total of 81.25% of its population living in urban areas, which favors the increase of the energy demand and characterizes a scenario where the urban space has an almost complete electric energy covering.

In terms of installed power capacity, Brazil has 1.235 enterprises in operation, which sum up a total power of 83 GW. For the next years, it is foreseen an increment of 37 GW, from the 87 enterprises under construction and 399 granted enterprises [19]. The sources of energy explored in Brazil include the Hydraulics, thermal power stations, nuclear plants, and wind power plants. Table 1 presents the situation of the enterprises in operation in the country.

4.2. Structure of the Brazilian electric power consumption

In Brazil, the regional and social inequality is a result of a process of the development option imposed by the capitalist political-economic system. "*The lack of the* '*social reform*' *and the incapacity of the national bourgeoisie in implementing social patterns compatible with the diversification degree and the growth of the economy*, *generate a deeply unequal society*" [20].

The electricity consumption is distributed in a quite unequal way among the Brazilian geographical areas, as happens in all Latin America. The contrasts in the electric power consumption are also an outcome of the differences in the development apprenticeship among these areas. It is noticed that the unequal partition of this resource is added to other factors that hinders a positive increment in the levels of quality of life of the poor populations, already established a lot below what can be considered minimally acceptable. Table 2 shows the levels of consumption of the Brazilian geographical areas and their respective populations.

Table 1
Enterprises in operation

Kind	Amount	Grated power (kW)	Power in commercial operation (kW)	%
Hydraulic power	154	107.956	86.598	0.10
Wind power	9	22.075	22.025	0.03
Small hydro power plants	208	882.822	871.345	1.05
Hydroelectric power plants	138	69.161.534	64.592.632	77.62
Thermoelectric power plants	724	18.934.117	15.631.972	18.79
Nuclear plants	2	2.007.000	2.007.000	2.41
Total	1.235	91.115.504	83.211.572	100

Source: Ref. [19].

Table 2
Electricity consumption in Brazil

Regions	Electricity consumption (GW h)			Participation in the consumption (%)	Population (%)
	1983	1993	2000		
North	3161	11,459	15,765	5.1	5.9
Northeast	20,292	38,266	49,582	16.2	28.5
Southeast	95,422	145,075	175,074	57.2	43.5
South	18,887	35,156	49,438	16.1	15.3
Center-West	4858	10,638	16,346	5.4	6.8
Brazil	142,620	240,594	306,207	100.0	100.0

Source: Ref. [24].

Table 3
Electric energy use and population for income band—Brazil, 1995

Income band in minimum salaries	Electric energy use (%)	Population (%)
1–2	2	50.0
2–4	10	14.3
4–5	14	14.3
5–7	17	11.9
Above 7	57	9.5

Source: Ref. [25].

The Brazilian residential sector answers for 25.2% of the total electricity consumption, being distributed for about 42 million consuming units. In the urban sector, the electricity presents high covering levels, but in the rural areas, the official data show that 20 million Brazilians do not have electricity. In the whole country, 92% of the homes have the electric power service. However, the covering in the regional level enlarges the disparities. In the Northeast, the electricity still does not arrive to 80% of the residences and in the Southeast and South regions, the service include more than 95% of the residences.

The mapping of electric power consumption for income band allows to visualize how perverse are the effects of the concentrated structure of income in Brazil in the appropriation of that good. Table 3 displays the values of electric power consumption to band of income, taking the national minimum salary[1] as a reference. It can be observed that the electric power consumption is concentrated in the class of income superior to seven minimum salaries, answering for 57% of the total consumption in a population represented by only 9.5% of Brazilians.

The analysis of presented data shows the distribution of the electric sector benefits in Brazil, which is developed with the contribution of the Brazilian society as a whole, once the most significant contributions of investments that fostered and guaranteed the system expansion and reliability were done by the Federal (the most part) and State Governments. In short, the whole society assumed the responsibility towards the debts to raise the sector

[1]The national minimum salary corresponds to approximately US$ 125.70 (August/2005).

while the benefits are discriminated, with a tendency of aggravating this discrimination in recently established private model since the immediate objectives of the new agents' of the sector are to maximize profits as a form of paying their shareholders, most part from outside the country.

4.3. The ethics and the electricity right

The current Brazilian constitution [21], in article 3,[2] affirms to be a fundamental objective of the Federal Republic of Brazil the construction of a free, fair and solidary society, the poverty eradication, and the reduction of regional social inequalities. The constitutional text is clear in what refers to the search of social development, only possible with the warranty of the access to what the society considers essential. Consequently, the only possible road to reach such objectives is the search for fulfilling the longings of those to whom the constitutional norms are destined. In these terms, the electric power availability in dwellings is linked directly to several public rights of essential character, for instance water, health and safety. To alleviate poverty means to integrate the Brazilian population to the goods and services provided for the stage of development reached by the whole society, giving a significant meaning to the term citizenship: equality.

The Federal Constitution of 1988 [21] in article 175[3] allows understanding as public services all those rendered by Public Power, not mattering if promoted in a direct way or through agents delegated for this purpose and submitted to the control of the States. The constitution makes clear that some services are of pure responsibility of the Federal Public Power affirming that hydraulics energy potentials are goods of the Union (art. 20, VIII),[4] which has the duty to explore, directly or by authorization, concession or permission, the services and electric power facilities (art. 21, XII, b)[5] besides competing to legislate about energy (art. 22, IV).[6] Thus, good electric power is of public nature. The Federal Constitution states that the services of providing electricity supply are essential and should always assist exclusively to the interests of the population [22].

The privatization of the Brazilian electric sector presented a favorable atmosphere so that the new private agents could recover their commercial losses and increase the number of consumers. These actions open the possibility to punish the families of low income once again because they restrict the legal access to the distribution system, which make them start to look for irregular connections to the grid as a way of guaranteeing their constitutional rights.

[2]"*Article* 3°—*The fundamental objectives of the Federative Republic of Brazil are*:

I—to build a free, just and solidary society;

II—to guarantee national development;

III—to eradicate poverty and substandard living conditions and to reduce social and regional inequalities;

IV—to promote the well-being of all, without prejudice as to origin, race, sex, colour, age and any other forms of discrimination."

[3]"*Article* 175—*It is incumbent upon the Government, as set forth by law, to provide public utility services, either directly or by concession or permit, which will always be through public bidding*".

[4]"*Article* 20—*The following are property of the Union*: [...] *VIII—The hydraulic energy potentials* [...]".

[5]"*Article* 21—*The Union shall have the power to*: [...] *XII—Operate, directly or through authorization, concession or permission*: [...] (*b*) *the electric power services and facilities and the energetic exploitation of watercourses, jointly with the states wherein those hydroenergetic potentials are located*; [...]".

[6]"*Article* 22—*The Union has the exclusive power to legislate on*: [...] *IV—waters, energy, informatics, telecommunications and radio broadcasting*; [...]".

It is quite usual in Latin America that the electric power distribution companies face serious problems of energy loss, mainly commercial, inherited from a state administration that did not prioritize the access warranty to the grid among the less favored population. These marginalized mass of people ends up to be pushed into the illegality in the electric power market. In the specific case of Brazil, the state governments were the former owners of the majority of the distribution companies and always shown an unwilling disposition to face the socio-political problems promoted by eventual programs of the clandestine consumers' disconnection. The majority of these consumers are residents of the slums and other poor areas.

The strategies attempted by the concessionary companies create in the society the idea that the clandestine access should be considered just by the criminal reading foreseen in the prevailing legislation. The media campaigns do not differentiate the origin of the promoted electric power deviation, so that the transgressors are exposed to the public as marginals without distinction.

The electric power deviations occur in different social classes, in slums or luxurious condominiums, commercial establishments, and small, medium and big industries. However, it is quite necessary to characterize the differences in the reasons for such deviations. The intention is not to promote the practice of the clandestine access to the distribution system, but to reinforce that the great volume of the deviations happens in communities of low income. For them, this is the only possible alternative of the electricity appropriation, knowingly necessary for the improvement of the well being inside the dwellings. Thus, it differs from the objectives of the consumers from the commercial and industrial sectors, and of the classes of larger income of the residential sector when illegally connected to the grid. The communities of low income do not opt for illegality as a way of obtaining an income; they look for the warranty of a constitutional right, which cannot be attributed to the other sectors above mentioned. The ultimate objectives of these ones are the reduction of costs or the survival of a business, serving more as an artifice to guarantee larger incomes or preserve consumption patterns incompatible with the purchasing power [23].

The interruption of essential services supply, like water and sewage, leaves the community in a risk situation to public health, once it favors to the proliferation of diseases easily transmitted. Such diseases would have their transmitting capacity blocked through the water and sewage treatment. The same analysis can be made when appraised the implications of the cut of electric power supply to the dwellers. When the Federal Constitution assures and recognizes the right to services that guarantee the human dignity, it introduces an insurmountable obstacle to the suspension of essential public services [22].

5. Concluding remarks

The adoption of the sustainability concept requires not only the viability of the economic approach but also the environmental and social variables, in order to achieve a larger justness in the income distribution and to better spread the gains acquired by the use of the natural resources with minimum damages to the planet and to the human race. A fair development process demands the interaction of the sustainability dimensions to harmonize different interests involving economical growth and social and ecological perspective. The man must be considered the center of the political and economic planning, which must also reflect the ethical issue defined by the whole society. The discussion of the ethical approach includes the imperative need of reducing poverty along with preventing

environmental degradation. In this context, the sustainability paradigmatic transformation comprehends the formulation of the social sustainability and the human development in sustainable basis.

In Brazil, the electric sector was developed with the directly and indirectly efforts of the entire society. The expressive investments to build the sector in order to guarantee the expansion and reliability of the electric system were made by the Federal and State Government. This means that the society assumed the responsibility for the dept of building the sector, but the benefits were discriminated. In Brazil, the regional and social inequalities were a result of a process of development option imposed by the political and economical capitalist system.

So, it is noticed that a hiatus exists between the constitutional precepts and its materialization. The social inequalities among classes deepened by the different levels of regional development moves away even more the possibilities of reaching the constitutional presuppositions in relation to the poverty alleviation and the reduction of the social and regional inequalities. On one side, the constitution guarantees the access of all the essential services for the man's dignity, and on the other side, such a right is denied because it is not noticed that public power actions lead the society for the elaboration of an ethical–political project of medium and long period that drives to surpass the social debts.

In the Brazilian territory, the hydroelectric expansion is primarily oriented to the North area, which is considered the less developed area of the country according to the market criteria. In this region, there are countless are more complex ethnic, socioeconomic and cultural conflicts. Most part of the remained Brazilian indigenous population is located in this area and the conflicts generated by the intense attempts of appropriation of their wealth has been obliging this population to face several challenges that result in losses in terms of their economic-financial or cultural patrimony. The electric sector has a history of attempts to occupy part of those lands for generation purposes, but they were not always successful. The planning of the electric sector must incorporate the ethics and the sustainability principles in its way of structuring and managing the sector as a public good in a way to reach the objectives stated in article 3 of the Brazilian constitution.

Consequently, there is an urgent need to adopt in an unrestricted form the concept of public good in the activities of the electric sector, guaranteeing a national effort addressed to democratize the debate of the decision-making agents in relation to the exploration, production and use of electric energy. The new choices should be driven under the reflectors of the ethics and sustainable precepts. Every society should reduce to zero the social debt and be aware of the effects of the previous choices on the involved communities. This last item is very important, and has the example of the communities reached by great dams, that moved from their cultural habitat on behalf of a development that most of the time denied them the right for the electricity. These examples must serve as a reminder to guide the future expansion of the Brazilian electric sector, avoiding it to be ruled by the strict guideline of the economical development.

The paradigm regarding the option of economic growth over equality must be reevaluated. The current economic development model has been proving that it is not capable of achieving all society with its benefits. Equality is a necessary condition for sustainable development of economy and society, and the consideration of this fact will lead to a renewed way of designing strategies for poverty alleviation and social inclusion. Instead of concentrating efforts on maximizing the well-being of wealthy citizens, better feedback will be obtained by investing in those who are at the base and that were denied

both the access, and benefits of the investments made. It has to be encouraged the expansion of opportunities for all, and the search for a collection of interests in order to integrate actions to built equitable partnerships in the development of new strategies.

People all over the world have high hopes that new technologies will lead to healthier lives, greater social freedom, increased knowledge and more productive livelihoods. In fact, technology is a response to market pressures not to the needs of little purchasing power people. It is true that economic growth generates opportunities for useful innovations to be created and diffused. However, the reverse process can also be valuable. Investments in technology can equip people with better tools and make them more productive and prosperous. Technology is not a reward, is a powerful tool for growth and development. A single innovation can quickly change the course of an entire society and in most cases, it is not a one-time gain as it has a multiplier effect, increasing people's knowledge and productivity, raising incomes, and building capacity to future innovation.

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